on which we may safely rely in ascertaining the *scale* of human passions) makes Andromache express more tender regard for her husband than for *Astyanax:* the whole interview indeed might be adduced as an Elucidation of a passage in Horace. I am, Sir, yours, &c. W.

*Newry December 4th,* 1808.

P. S. I must assure P. that I controvert the meaning of the passage merely with a view to *elucidate*, not to *combat*. I wish and hope he may consider this communication in the same light.

*For the Belfast Monthly Magazine.*

AN account of the new discoveries in chemistry, particularly the decomposition of alkalies, and the formation of the two substances, Potassium and Sodaum, by means of the Galvanic Batteries, by Professor Davy, of the Royal Institution, as communicated by him to the Royal Society of London.*

Mr. Davy first described the methods made use of for the decomposition of fixed alkalies, and he found that the powers of electrical decompositions were proportional to the strength of the opposite electricities in the circuit, and to the conducting power and degree of concentration of the materials employed. In his first attempts at the decomposition of the fixed alkalies, he acted upon aqueous solutions of potash and soda, saturated at the common degrees of temperature, with the Voltaic batteries, but in these cases the water alone was affected, and hydrogen and oxygen disengaged, with the production of much heat and violent effervescence. As water appeared to prevent the decomposition, he used potash in igneous fusion, and some brilliant phenomena were produced, and when the platina spoon on which the potash was placed was made to communicate with the negative side of the battery, and the connection from the positive side was made with platina wire, a vivid and constant light appeared at the opposite point: there was no effect of inflammation round it; but aeriform bubbles, which inflamed in the atmosphere, rose round the potash. He made some attempts to collect the combustible matter, but without success; he only attained his object, by employing electricity as the common agent of fusion and decomposition.

Pot-ash, when perfectly dried by ignition, is a non-conductor; but with the slightest addition of moisture, becomes a good conductor, and in this state it readily fuses and decomposes by strong electrical powers. Having placed a small piece of pure pot-ash, on an insulated disk of platina, connected with the negative side of the battery, and a platina wire communicating with the positive side being brought in contact with the upper surface of the alkali, a vivid action almost instantly took place; the pot-ash fused at both points of electrization; there was a violent effervescence at the upper surface; at the lower, or negative surface, there was no liberation of elastic fluid; but small globules having a high metallic lustre, similar in visible characters to mercury, appeared; some of which burnt with explosion and bright flame, as soon as they were formed, and others remained, and were merely tarnished, and finally covered with a white film, which formed on their surfaces.

"These globules," says the professor, "numerous experiments soon showed to be the substance I was in search of, and a peculiar inflammable principle, the basis of pot-ash." He ascertained that the platina was not at all connected with the result, for the same substance was produced when other metals, or charcoal, were employed for completing the circuit.

Soda, when acted upon in a similar manner, exhibited an analogous result, but it required a battery of strong powers. The substance produced from pot-ash, which is now denominated "Potassium," remained fluid at the temperature of the atmosphere, at the time of its production; that from soda, called "Sodaum," which was fluid, in the degree of heat of the alkali during its formation, became solid on cooling. The globules often burnt at the moment of their formation, and sometimes violently exploded and separated into smaller globules, which flew with great velocity through the air, in a

* This analysis is taken from the last number of Philips' Monthly Magazine.

state of vivid combustion, producing a beautiful effect of continued jets of fire.

In speaking of the theory, Mr. Davy observed, "that the metallic lustre of the substance from Potash immediately became destroyed in the atmosphere, and that a white crust formed upon it." This crust is pure potash, which immediately deliquesced, and new quantities were formed, which in their turn, attracted moisture from the atmosphere, till the whole globule disappeared, and assumed the form of a saturated solution of potash. Water is likewise decomposed in the process, for it is demonstrated that the basis of the fixed alkalies, that is "Potassium and Sodaum," act upon this substance with greater energy than any other known bodies. Hence the minute theory of oxydation of the basis of the alkalies in the air is this; oxygen gas is first attracted by them, and alkali formed; this alkali speedily absorbs water, this water is again decomposed; therefore, during the conversion of a globule into alkaline solution, there is a constant and rapid disengagement of small quantities of gas. From the facts related, of which we mention only a part, it is inferred by Mr. Davy, that there is the same evidence for the decomposition of potash and soda into oxygen and two peculiar substances, as there is for the decompositions of sulphuric and phosphoric acids, and the metallic oxydes into oxygen and their respective bases. In the analysis, no substances capable of decomposition are present, but the alkalies and a minute portion of moisture, which seems in no other way essential to the result, than in rendering them conductors at the surface; for he has ascertained that the new substances are not generated, till the interior, which is dry, begins to be fused.

The combustible bases of the fixed alkalies seem to be repelled as other combustible substances by positively electrified surfaces, and attracted by negatively electrified surfaces, and the oxygen follows the contrary order; or, the oxygen being naturally possessed of the negative energy, and the bases of the positive, do not remain in combination, when either of them is brought into an electrical state opposite to its natural one.

After Mr. Davy detected the bases of the fixed alkalies, he found great difficulty in preserving and confining them so as to examine their properties, but he found that in recently distilled naphtha, they might be preserved some days without much change. The basis of pot-ash at 60° of Fahrenheit possessed the general appearance of mercury, so as not to be distinguished from it; but at that degree of temperature, it is only imperfectly fluid: at 70° it is more fluid, and at 100° its fluidity is perfect, so that different globules will run into one. At 50° it is soft and malleable, with the lustre of polished silver, and at the freezing point it becomes harder and brittle, and when broken into fragments, exhibits a crystallized texture, which by means of the microscope, seems composed of beautiful facets of a perfect whiteness, and high metallic splendor. At a heat approaching redness, it is converted into vapour, and is found unaltered after distillation. It is a perfect conductor of electricity.

When a spark is taken by the Voltaic battery from a large globule, the light is green, and combustion takes place at the point of contact only. When a small globule is used, it is completely dissipated with explosion, accompanied by a most vivid flame. It is an excellent conductor of heat; but resembling the metals in all these sensible properties, it is very different from any of them in specific gravity, being only as 6 to 10 compared with water, so that it is the lightest fluid body known.

With respect to chemical relations, it combines with oxygen slowly and without flame at all temperatures below that of vaporization; but at this temperature combustion takes place, and the light is of brilliant whiteness, and the heat intense. When a globule is heated in hydrogen gas, at a degree below its point of vaporization, it seems to dissolve in it, for the globule diminishes in volume, and the gas explodes with alkaline fumes and bright light, when suffered to pass into the air. When brought into contact with water, it decomposes it with great violence, an instantaneous explosion is produced with bright flame, and a solution of pure pot-ash is the result. When a globule of this subtance is placed upon ice, it instantly burns with a bright

flame, and a deep hole is made in the ice, which is found to contain a solution of pot-ash.

*Theory*.—The phœnomena seem to depend on the strong attraction of the potassium for oxygen; and of the potash for water. The heat which arises from two causes, decomposition and combination, is sufficiently intense to produce inflammation. The production of alkali in the decomposition of water by potassium, is shown by dropping a globule of it upon moistened paper, tinged with turmeric. At the moment that the globule comes into contact with the water it burns, and moves rapidly upon the paper, as if in search of moisture, leaving behind it a deep reddish brown trace, and acting upon the paper as dry caustic potash.

So strong is the attraction of potash for oxygen, and so great the energy of its action upon water, that it discovers and decomposes the small quantities of water contained in alcohol and ether. Potash is insoluble in ether, but when potassium, the basis, is thrown into it, oxygen is furnished, and hydrogen gas is disengaged, and the alkali, as it forms, renders the ether white and turbid. In ether and alcohol, the energy of its action is proportioned to the quantity of water they contain, and hydrogen and pot-ash are the constant result. Potassium thrown into solutions of the mineral acids, inflames and burns on the surface. It readily combines with the simple and inflammable solids, and with metals, with phosphorus and sulphur, forming compounds similar to the metallic phosphurets and sulphurets. When it is brought into contact with a piece of phosphorus, and pressed upon, there is a considerable action; they become fluid together, burn, and produce phosphate of potash. When potassium is brought into contact with sulphur in fusion in the atmosphere, a great inflammation takes place, and sulphuret of potash is formed. The sulphuretted basis becomes oxygenated by exposure to the air, and is finally converted into sulphate. When one part of potassium is added to eight or ten parts of mercury, at about 60° of Fahrenheit, they instantly unite, and form a substance like mercury in colour, but less coherent, and small portions of it appear as flattened spheres. When a globule is made to touch a globule of mercury about twice as large, they combine with heat; the compound is fluid at the temperature of its formation, but when cool it appears as a solid metal, similar in colour to silver. If the potassium be still increased, the amalgam becomes harder and brittle. When the proportions are one of potassium to seventy of mercury, the amalgam is soft and malleable. If the compounds are exposed to air, they rapidly absorb oxygen; potash which deliquesces is formed, and in a few minutes the mercury is found pure and unaltered.—When a globule of amalgam is thrown into water, it rapidly decomposes it, with a hissing noise; potash is formed, pure hydrogen is disengaged, and the mercury remains free. The action of potassium upon the inflammable oily compound bodies, confirms the other facts of the strength of its attraction for oxygen. On recently distilled naphtha that has been exposed to the air, it soon oxydates, and alkali is formed, which unites with the naphtha into a brown soap that collects round the globule. On concrete and fixed oils, when heated, it acts slowly, coaly matter is deposited, a little gas is evolved, and a soap is formed. By heat it rapidly decomposes the volatile oils.

Potassium readily reduces metallic oxydes when heated in contact with them; it decomposes readily flint and green glass with a gentle heat; alkali is immediately formed by oxygen from the oxydes, which dissolves the glass, and a new surface is soon exposed to the agent.

We shall in our next give a more detailed account of the decomposition of soda.

*For the Belfast Monthly Magazine.*

PARAMYTHIA; FROM THE GERMAN OF HERDER.

THE following fables from the Greek mythology, which have already appeared in the Monthly Repository of Theology, seem to possess sufficient merit to recommend them to the perusal of the readers of our Miscellany.—They are taken from the Zersheute Blätter, and are introduced with the following remarks.